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Review of the Asian wood-boring genus *Euxiphydria* (Hymenoptera, Symphyta, Xiphydriidae)

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Abstract

Five species of *Euxiphydria* are recognized, *E. leucopoda* Takeuchi, 1938, from Japan, *E. potanini* (Jakovlev, 1891) from Japan, Russia, Korea, and China, *E. pseudoruficeps* Okutani, 1966, from Taiwan, *E. vietnamensis*, sp. n. from Vietnam, and *E. shaanxiana*, sp. n., from China. *Euxiphydria subtrifida* Maa, 1944, is considered a new synonym of *E. potanini*. A key and illustrations are given to distinguish the species.

Keywords

Woodborers, Palearctic, Oriental, *Hyperxiphia*

Introduction

Euxiphydria is an exclusively eastern Asian genus occurring from Japan and eastern Russia south to China, Vietnam, and Taiwan. Three species were listed by Smith (1978) and Taeger et al. (2010). Earlier keys to species by Gussakovskij (1935), Takeuchi (1938) and Maa (1944, 1949) included from two to four species in the genus. An ad-

ditional species was described from Taiwan by Okutani (1966). Here, we recognize five species, two of which are new, and give the first record for Vietnam, the southernmost record for the genus.

The only host record is *Acer mono* Maxim. (Aceraceae) for *E. potanini* (Jakovlev, 1891) (Krivolutskaya and Stroganova 1966, Stroganova 1968). We assume larvae of *Euxiphydria* live and feed in weakened or dying small branches and limbs as is typical for most xiphydriids.

Materials and methods

Material used in this study is deposited in the following: National Museum of Nature and Science, Tokyo, Japan (NSMT); National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA (USNM); Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (SDEI); Entomological Laboratory, Osaka Prefecture University, Sakai, Japan (OPU); Entomological Laboratory, Kyushu University, Fukuoka, Japan (KU); Hungarian Natural History Museum, Budapest (HNHM); Museum für Naturkunde, Humboldt-Universität zu Berlin, Germany (MNHU); collection of Pierre Tripotin, Mont Saint-Aignan, France (PT); Institute of Zoology, Chinese Academy of Sciences, Beijing, China (IZB).

Images were obtained using an EntoVision Imaging Suite that included a firewire JVC KY-75 3CCD digital camera mounted to a Leica M16 zoom lens via a Leica z-step microscope stand. Multiple focal planes were merged using Cartograph 5.6.0 (Microvision Instruments, France) software.

Results

Euxiphydria Semenov & Gussakovskij <http://species-id.net/wiki/Euxiphydria>

Euxiphydria Semenov & Gussakovskij 1935: 117. Type species: *Xiphydria potanini* Jakovlev 1891, by original designation.

Diagnosis. Species are typically black with a contrastingly orange or mostly orange head (Figs 1, 13, 23, 30, 37). Antenna with 13–19 antennomeres, middle antennomeres dilated and compressed (Fig. 29). Head polished and shiny on upper genae and vertex to about level of lateral ocelli, variously sculptured on frons below lateral ocelli; in front view, inner margins of eyes parallel to slightly diverging below, lower interocular distance 1.4–1.7× eye height (Figs 4, 18, 28, 34, 41); head from above with distance behind eyes about equal to (Figs 3, 40) or longer than eye length (Figs 17, 27, 33); area posterior to upper orbits in profile usually longer than eye length; both mandibles 4-dentate; maxillary palpus (Figs 20, 35) slender, with four palpomeres;

labial palpus (Figs 20, 35) with three palpomeres, first two palpomeres slender and third palpomere dilated, oval, with sensory pit. Forewing (Figs 1, 23, 36) with cell R closed, vein 2A+3A complete. Hind wing (Figs 1, 23, 36) with cell R closed, cells Rs and M present; anal cell present, petiole subequal to width of cell. Tarsal claws with long inner tooth near center of claw, about half length of outer tooth; claw of hind legs larger than those of fore- and midlegs. Tergite 10 posteriorly tubuliform, strongly protruding caudad.

Discussion. The above combination of characters will separate *Euxiphydria* from other xiphydriid genera. The only other genus with four maxillary palpomeres and three labial palpomeres is *Carinoxiphia* Wei (in Wei and Xiao 1999). In *Carinoxiphia*, the third labial palpomere is slender, the same width as the first two palpomeres, the radial cell of the forewing is open at its apex, the tarsal claws have a minute inner tooth, and the wings are hyaline. Other xiphydriid genera have a different palpomere formula, commonly with three or five maxillary palpomeres, have a slender third labial palpomere, are usually black with various white, yellow, or orange markings, the eyes are larger, commonly converging with the lower interocular distance equal to or shorter than the eye height, the head behind the eye in dorsal view is commonly strongly narrowing with the distance behind the eyes shorter than the eye length, the antennae various but commonly filiform, and the tarsal claws may be simple or with the inner tooth nearly as long as the outer tooth and close to the outer tooth.

Four species were described prior to 1938, *Xiphydria potanini* Jakovlev, 1891, *X. ruficeps* Mocsáry, 1909, *X. ruficeps* Matsumura, 1912, and *Xiphydria maidli* Zirngiebl, 1937. When describing the genus, Semenov and Gussakovskij (1935) recognized and separated two species, *E. potanini* and *E. ruficeps* (= *ruficeps* Matsumura), and Gussakovskij (1935) recognized and separated the same two species. Takeuchi (1938) treated two species from Japan, *E. ruficeps* (= *potanini*, *ruficeps* Matsumura, *akazui* Matsumura, and *maidli* Zirngiebl) and *E. leucopoda*, a second species described from Japan with a new form, which he called *Euxiphydria leucopoda* var. *nakanishii*. Maa (1944) keyed four species, his newly described *E. atriceps* and *E. subtrifida*, as well as *E. potanini* and *E. ruficeps*. Later, Maa (1949) transferred *E. leucopoda*, *E. nakanishii*, and *E. atriceps* to *Hyperxiphia* Maa, and recognized *E. potanini*, *E. ruficeps*, *E. subtrifida*, and *E. maidli*. He also proposed a new subfamily, Euxiphydriinae, including only *Euxiphydria*. The only subsequent species described was *E. pseudoruficeps* Okutani, 1966, from Taiwan. The catalogs by Smith (1978) and Taeger et al. (2010) have followed Takeuchi (1938) and Stroganova (1968) by regarding *E. potanini* as a variable species and including *X. ruficeps* Mocsáry, *X. ruficeps* Matsumura, *X. akazui*, and *X. maidli* as synonyms, and listing two other species, *E. subtrifida* Maa and *E. pseudoruficeps* as distinct species. Here, we recognize five species, the more common *E. potanini* with synonymy as given by Smith (1978) and Taeger et al. (2010), but also proposing *E. subtrifida* as a new synonym, placing *E. leucopoda* back into *Euxiphydria*, recognizing *E. pseudoruficeps* as a distinct species, and describing two new species, one from China and one from Vietnam.

Key to species

1 Legs entirely black; abdomen black (Figs 13, 24, 37) 2

— Legs entirely white or black with basal third of hind tibia and hind basitarsomere white; abdomen with white spot laterally on eighth tergite (Figs 2, 30) 4

2 Head orange with frons from about level of lateral ocelli to clypeus black (Figs 17, 18); frons densely rugose (Fig. 18); axilla and mesoscutellum reticulate (Fig. 15); wings black, paler toward apex (Fig. 16) *potanini* (Jakovlev)

— Head entirely orange (Figs 27, 28, 40, 41); frons with irregular carinae at least close to antennal toruli (Figs 28, 41); axilla and mesoscutellum with irregular longitudinal carinae (Figs 26, 39); wings almost hyaline to very slightly, uniformly infuscate (Figs 23, 36) 3

3 Head from above narrowing behind eyes, distance behind eyes equal to eye length (Fig. 40); sculpture on frons reticulate in front of ocelli with carinae close to antennal toruli (Fig. 41); carinae on mesepimeron short, irregular (Fig. 38) *shaanxiana* sp. n.

— Head from above gently curved behind eyes; distance behind eye much longer than eye length (Fig. 27); sculpture on frons consisting of more or less parallel carinae, without reticulations (Fig. 28); carinae on mesepimeron long, straight, almost parallel (Fig. 25) *pseudoruficeps* Okutani

4 Legs white, apical tarsomeres brownish (Fig. 2); frons reticulate (Fig. 4); head from above strongly narrowing behind eyes, distance behind eye less than eye length (Fig. 3); axilla and mesoscutellum with irregular, longitudinal carinae, smooth and shiny laterally and posteriorly (Fig. 5) *leucopoda* Takeuchi

— Legs black with basal third of hind tibia and hind basitarsomere white (Fig. 30); frons with almost parallel carinae (Fig. 34); head from above straight behind eyes, distance behind eye much longer than eye length (Fig. 33); axilla and mesoscutellum entirely sculptured, reticulate (Fig. 32) *vietnamensis* sp. n.

Euxiphydria leucopoda Takeuchi

http://species-id.net/wiki/Euxiphydria_leucopoda

Figs 1–6

Euxiphydria leucopoda Takeuchi 1938: 183, fig. 2.

Hyperxiphia leucopoda: Maa 1949: 39.

Diagnosis. Length, 9.0–12.0 mm. Head orange, except medial black stripe on vertex extending anteriorly through ocelli and anterior to ocelli as an inverted V (Figs 3, 4). Antenna dark brown with scape and pedicel reddish; Thorax black with tegula, anteroventral quarter and narrow posterior margin of pronotum white (Figs 2, 5). Abdomen black with white spot laterally on eighth tergite (Fig. 1). Legs entirely white



Figures 1–6. *Euxiphydria leucopoda*, holotype **1** Dorsal view **2** Lateral view **3** Head, dorsal view **4** Head, front view **5** Thorax, dorsal view **6** Thorax, lateral view.

to yellow except apex of apical tarsomeres brownish (Fig. 2). Wings hyaline, veins and stigma black (Fig. 1). Antenna with 13 antennomeres; length of first four antennomeres as 1.0:0.4:0.8:0.5. Frons sculpture reticulate, especially around and anterior to ocelli (Figs 3, 4). Head from above strongly narrowing behind eyes, distance behind eye less than eye length (Fig. 3). Malar space between eye and antennal groove much narrower than groove. Axilla and mesoscutellum with irregular longitudinal carinae; lateral and posterior downturned areas smooth and shiny (Fig. 5). Hind basitarsomere slightly longer than length of remaining tarsomeres combined. Lengths of sheath and basal plate subequal. Male unknown.

Distribution. Japan: Honshu; Shikoku (Togashi 1974).

Specimens examined. Holotype. Female, labeled "19,VII,1920, Daisen, Takeuchi," "Euxiphydria leucopoda Takeu., Holotype" (OPU). Takeuchi (1938) stated July 15 in the original description but it appears to be "19" on the label. "Mt. Haku, 5/VIII.1968" (1 ♀, USNM, identified as *E. leucopoda* by Togashi).

Discussion. *Euxiphydria leucopoda* was transferred to *Hyperxiphia* by Maa (1949) without explanation, but it is actually an *Euxiphydria* as described by Takeuchi (1938). *Euxiphydria leucopoda* has three labial palpomeres with the third clavate and four maxillary palpomeres, as well as other characteristics of *Euxiphydria* except for the head which is short and narrowing behind the eyes in dorsal view. *Hyperxiphia* has three labial palpomeres of equal width and has five maxillary palpomeres. The holotype is a small specimen, about 9 mm long. The specimen from Mt. Haku is 12 mm long.

Takeuchi (1938) described a variety, *Euxiphydria leucopoda* var. *nakanishii*, which he stated to be similar in structure to the typical, but smaller, the hind basitarsomere distinctly shorter than the following tarsomeres together, and differing in color with the head entirely black except for pale yellow below the antennae. This is actually a different species and genus and was correctly placed in *Hyperxiphia* by Maa (1949). The holotype is at OPU and is labeled "8,VIII,1938, Daisen, Takeuchi," "Euxiphydria leucopoda nakanishii Tak., Holotype." It has not been illustrated; therefore, we provide Figs 7–12 for its recognition and comparison with *E. leucopoda*.

Euxiphydria potanini (Jakovlev)

http://species-id.net/wiki/Euxiphydria_potanini

Figs 13–22

Xiphydria Potanini Jakovlev 1891: 3, 15–16.

Euxiphydria potanini: Semenov & Gussakovskij 1935: 117.

Xiphydria ruficeps Mocsáry 1909: 39. Synonymy by Semenov 1921: 83.

Euxiphydria ruficeps: Semenov & Gussakovskij 1935: 117.

Xiphydria ruficeps Matsumura 1912: 210, pl. 54, fig. 22. Preoccupied by *Xiphydria ruficeps* Mocsáry, 1909. Synonymy by Takeuchi 1936: 54.

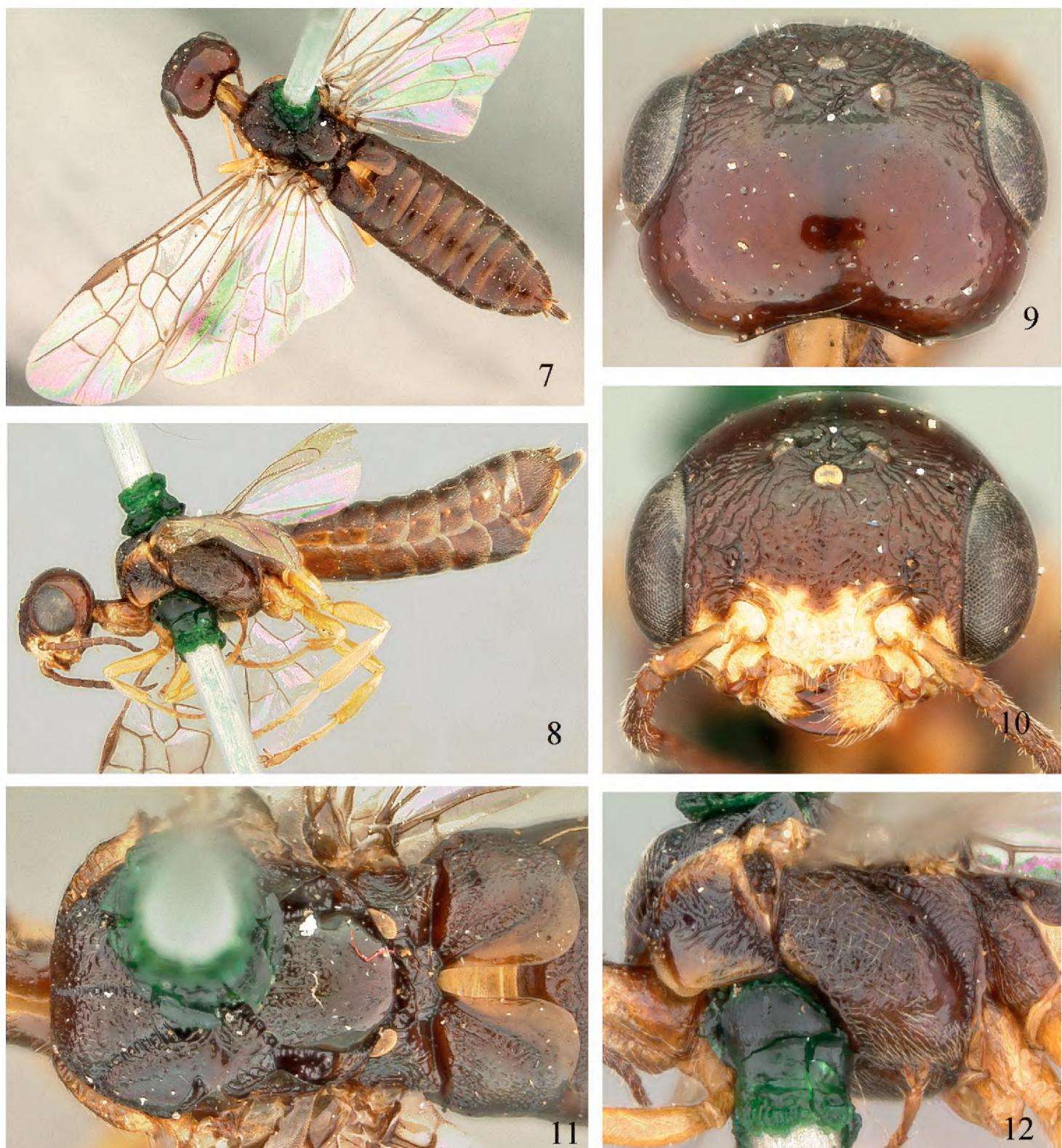
Xiphydria akazui Matsumura 1932: 31, 44, pl. 8, fig. 9. New name for *Xiphydria ruficeps* Matsumura (see below). Synonymy by Takeuchi 1936: 54.

Xiphydria Maidli Zirngiebl 1937: 342. Synonymy by Takeuchi 1938: 183.

Euxiphydria subtrifida Maa 1944: 33. new synonymy.

For other subsequent references, see Smith (1978).

Diagnosis. Length, 10.0–20.0 mm. Black, head bright orange on genae and vertex behind ocelli (Figs 16–18). Wings darkly infuscate, more hyaline apical to stigma (Fig. 16). Frons densely rugose to reticulate, reticulations extending behind ocelli onto anterior part of vertex (Fig. 18) and onto lower half of genae (Fig. 19). Antenna with 13–16 antennomeres; length of first four antennomeres as 1.0:0.3:0.8:0.4.. Malar space between eye and antennal groove broad, equal to length of groove (Fig. 18). Head from



Figures 7–12. *Hyperxiphia nakanishii*, holotype **7** Dorsal view **8** Lateral view **9** Head, dorsal view **10** Head, front view **11** Thorax, dorsal view **12** Thorax, lateral view.

above slightly broadened behind eyes, distance behind eyes longer than eye length (Fig. 17). Axilla and mesoscutellum entirely densely, reticulately sculptured (Fig. 15). Mesepimeron with short, irregular carinae (Fig. 14). Hind basitarsomere shorter than length of remaining tarsomeres combined, as 0.7:1.0. Length of sheath slightly shorter than length of basal plate. Male similar to female; genitalia as in Figs 21, 22.

Types. *Xiphydria potanini* was described from a single female from “Chinæ prov. Gan-ssu.” Semenov & Gussakovskij (1935) stated that the type is at the Institute of Zoology, Academy of Sciences, St. Petersburg, Russia.



Figures 13–15. *Euxiphydria potanini* **13** Lateral view **14** Thorax, lateral view **15** Thorax, dorsal view.



Figures 16–20. *Euxiphydria potanini* **16** Dorsal view **17** Head, dorsal view **18** Head, front view **19** Head, lateral view **20** Mouthparts (labial palpi above, maxillary palpi below).

Mocsáry (1909) described *Xiphydria ruficeps* from “Sibiria orientalis: Ussuri (Kasakewitsch).” He did not state the number of specimens. Two females labeled as types are in the HNHM. One is labeled “Ussuri, Kasakewitsch, 1907, Korb,” “Typus 1909 Xiphydria ruficeps Mocs.,” “DEI – GISHym 10948” and the other “Ussuri,” “Typus



Figures 21–22. *Euxiphydria potanini*, male genitalia **21** Dorsal view **22** Ventral view.

1909 *Xiphydria ruficeps* Mocs., “DEI – GISHym 10949.” The specimen with “Kasakewitsch” on the label is here designated lectotype; the other specimen labeled only “Ussuri” is a paralectotype.

The lectotype of *Xiphydria ruficeps* Matsumura, described from “Hokkaido (Sapporo)” is at Hokkaido University, Sapporo, Japan. The number of specimens was not given by Matsumura, but the treatment of Matsumura’s xiphydriid types by Watanabe (1956) serves as a lectotype designation.

Xiphydria akazui first appeared in Matsumura (1932) wherein Matsumura cited it as “*Xiphydria akazui* (*X. ruficeps* Mats.)” in the Japanese section (p. 31), although only “*Xiphydria akazui*” was given in the English part of the book (p. 44). In the footnote on page 44, Matsumura mentioned “This may be a form of *X. ruficeps* Mocz [sic].” Matsumura may have recognized that his name *Xiphydria ruficeps* was preoccupied by *X. ruficeps* Mocsáry, and thus merely proposed a replacement name, *X. akazui*, for his species rather than intending to describe a new species. He did not specifically state that *X. akazui* was a new species or that it was a proposal of a new name, but he follows with a brief description. *Xiphydria akazui* is entered in the catalogs by Smith (1978) and Taeger et al. (2010) as a new species, not a replacement name. If regarded as a new species, the type specimen of *X. akazui*, may be the same specimen as the type of *X. ruficeps* Matsumura. Indications supporting that Matsumura (1932) proposed a new name and did not intend *X. akazui* to be a new species are that Watanabe (1956) did not give it in his list of Matsumura’s type specimens of Xiphydriidae. Matsumura always indicated that taxa were new when describing them, and there are no specimens of xiphydriids labeled *X. akazui* in Matsumura’s collection at the University of Hokkaido; there is only one specimen with a red label and Watanabe’s identification label of *X. ruficeps* (Ohara, pers. comm.).

Xiphydria maidli was described by Zirngiebl (1937) from “Ostsibirien (Ajetachka-Krasnaja bei Chabarowska).” The holotype is in the Naturhistorisches Museum, Vienna, Austria, and a paratype female from “Japan (Nopporo)” is in the Zoologische Staatssammlung, Munich, Germany. Blank (1996) regarded the two specimens as syntypes and unnecessarily designated a lectotype for this species. S. M. Blank (pers. comm.) pointed out that Zirngiebl stated “Typ” in the singular for the Siberian specimen, which therefore is the holotype. The other specimen from Japan would be a paratype.

In the introduction to his 1944 paper, Maa stated that the types of species “when not specially mentioned, are deposited in author’s collection.” Under type specimens for *Euxiphydria subtrifida*, he stated “Mao-Shan, Lungchien Hsien, SW, Chekiang, 3–5.vii.1939 (H. C. Yao), 5 males. Further paratotypes in the collection of the Provincial Institute for Agricultural Improvement, Sungyang, Chekiang.” A holotype was not designated, and therefore the five males are considered syntypes. We assume they are in the “author’s collection,” since he stated that the additional specimens are in Chekiang. This was verified by the junior author, who made note that the syntypes are in the Taiwan Agricultural Research Institute Wufeng near Taichung (Shinohara 1988).

Distribution. CHINA: Heilongjiang and Tibet (Xiao et al. 1992); Henan (Wei et al. 2008); Fujian (Wei and Nie 2003, as *subtrifida*); Gansu (type locality, Jakovlev 1891); Hunan; Jilin (=Kirin); Zhejiang (=Chekiang, Maa 1944). JAPAN: Hokkaido, Honshu, Shikoku. NORTH KOREA: Mt. Geumgangsan. RUSSIA: Amur, Primorskii Krai, Sakhalin (Semenov and Gussakovskij 1935). SOUTH KOREA: Gangwon-do, Gyeonggi-do (Smith et al. 2011). Distributions and additional specific localities covering the countries listed are given in Matsumura (1927, 1930, 1931, 1932), Semenov and Gusakovskij (1935), Smith et al. (2011), Takeuchi (1937a, 1937b), Togashi (1973, 1974), Watanabe (1956), Wei et al. (2008), Xiao et al. (1992) and Yano (1917).

Specimens examined. CHINA: “Mandchourie, Prov.: Kirin, Kao-lin-tze,” “20. IV.40” (1 ♀, USNM, det by Maa 1948); “Manchukuo, Koolingtze, 13.7.40, Alin” (MNHU); Hunan, Mt. Yunshan, 1200 m, nr. Wugang, 4.V.2009, A. Shinohara (1 ♀, 5 ♂, NSMT, USNM), same except 10.V.2009 (4 ♂, NSMT), same except 5.V.2009 (1 ♂, NSMT). JAPAN: Ikutawara, Engaru, Hokkaido, 28. VII. 1981, T. Kinoshita (2 ♀, NSMT); same except 30. VII. 1982 (4 ♀, NSMT, USNM); Akkeshi, Kushiro, Hokkaido, 19. VII. 2002, A. Shinohara (1 ♀, NSMT); Horoka, Tokachi, Hokkaido, 25, VII. 1974, A. Watanabe (1 ♀, NSMT); Horoka—Mitsumata, Tokachi, Hokkaido, 20–21, VI. 1998, H. Hara (1 ♀, NSMT); Sounkyo, Kamikawa, Hokkaido, 18. VII. 1971, A. Shinohara (1 ♀, NSMT); same locality, 2. VII. 1984, R. Kano (1 ♀, NSMT); Arashiyama, Asahigawa, Hokkaido, 26. VII. 1987, H. Matsuura (1 ♀, NSMT); Ichinosawa, nr. Jozankei, Sapporo, Hokkaido, 26. VI. 1984, A. Shinohara (1 ♀, NSMT); Meguro—Chattsunai, Erimo, Hidaka, Hokkaido, 28. VII. 1984, M. Tomokuni (1 ♀, NSMT); Tashiro, Miyako, Iwate Pref., 15. VI. 1986, K. Emoto (1 ♀, NSMT); Akane-rindo, Yokote, Haranomachi, Fukushima Pref., 6. VI. 1980, T. Shimomura (1 ♀, NSMT); same locality, 8. VI. 1980, S. Tsuyuki (1 ♀, NSMT); same locality, 24. VI. 1984, S. Ohmomo (1 ♀, NSMT); Hodosan, Nagatoro, Saitama Pref., 18. VI.

1994, K. Emoto (1 ♀, NSMT); Kamiange, Mt. Jinbayama, Tokyo Met., 7. V. 1998, A. Shinohara (1 ♀, NSMT); Hikagezawa, Mt. Takaosan, Tokyo Met., 20. V. 1990, S. Ueno (1 ♀, NSMT); Nippara, Okutama, Tokyo Met., 24. V. 1964, T. Nakamura (1 ♀, NSMT); Aikawamachi, Kanagawa Pref., 16. VI. 1984, T. Kinoshita (2 ♀, NSMT); Miyagase, Sagami, Kanagawa Pref., 28.V. 1955, S. Asahina (1 ♀, NSMT); Mt. Daibosatsu, Yamanashi Pref., 27. VI. 1976, K. Mizuno (1 ♀, NSMT); Koganezawa, Otsuki, Yamanashi Pref., 26. V. 1974, K. Kimura (2 ♀, NSMT); Doisokoiso—Mitsuzawa, Shimobe, Minobumachi, Yamanashi Pref., 8. VI. 2005, S. Tsuyuki (1 ♀, NSMT); Azusayama, Kawakami, Nagano Pref., 5. VII. 1980, Y. Kurosawa (1 ♀, NSMT); Omi, Ohara, Sakyoku, Kyoto Pref., 16. VI. 1984, W. Suzuki (2 ♀, NSMT); “Aidake, Torigoe-Mura, Ishikawa Pref., 27.V.1973, I. Togashi (1 ♀, USNM, det by Togashi, 1974); “105, Col. Kumamoto, Ibukisan (Shiga), 22.VI.1980 (1 ♂, SDEI). NORTH KOREA: Mt. Kongo, [= Mt. Geumgangsan,], Chosen, July 28, 1924, Coll. Y. Kurisue (1 ♀, NSMT). RUSSIA: Ussuri, Kasakewitsch (types of *X. ruficeps*, HNHM); Szahalin, Csehovo-hegy, Z. Szklon, 15.VI.1995, Ermolenko (1 ♀, HNHM). SOUTH KOREA: Gyeonggi-do, Hakwanggyo-dong, Suwon, 8.VI.2009, A. Shinohara (1 ♀, NSMT); Gangwon-do, Odaesan, Pyeongchang-gun, Yeonggam-sa, alt. 800 m, 9.VI.2003, P. Tripotin (1♀, PT); Gangwon-do, Samcheok-si, Hegang-myeon, Gajeon-ri, N. 37°22', E128°33', 6 Malaise traps, 5–18-VI-2007, Tripotin rec. (1 ♀, PT).

Host. *Acer mono* Maxim. (Aceraceae) is the only recorded host for this species (Krivolutskaya and Stroganova 1966, Stroganova 1968).

Discussion. Although we do not have access to types of all species, we have examined a good number of specimens and can now give a better idea of variation and distribution of this species in Asia.

Two described species were placed in *Euxiphydria* by Semenov & Gussakovskij (1935) when they described the genus, *Xiphydria potanini*, known from a single specimen, and *X. ruficeps* Mocsáry recorded from the eastern coast of Russia (Ussuri and Vladivostok areas, Sakhalin), Japan, and China (Kirin, Manchuria). The two were kept separate by their size (*E. potanini* 10 mm and *E. ruficeps* 12–17 mm), different number of antennomeres (13 in *E. potanini*, 14 in *E. ruficeps*), shape of the radial cell in the forewing (more narrowly rounded in *E. potanini*), position of crossvein 1m-cu in the forewing (interstitial with 2r-m in *E. potanini*, meeting M apical to 2r-m in *E. ruficeps*), length vs. width of cell 1CU in the forewing (longer in *E. potanini*), wing color (less infuscated in *E. potanini*) and mesopleural sculpturation (denser in *E. potanini*). Gussakovskij (1935) retained these characters, separating the same two species. Takeuchi (1938) considered these characters variable and considered *X. potanini*, *X. ruficeps* Mocsáry, *X. ruficeps* Matsumura, *X. akazui*, and *X. maidli* (as a new synonym) synonymous. Maa (1944), however, retained *E. potanini* and *E. ruficeps* as distinct species and added another, *Euxiphydria subtrifida*. In 1949, Maa, being quite cautious, kept *E. potanini*, *E. ruficeps*, *E. subtrifida*, and *E. maidli* as separate species, even though he pointed out the variability of the characters used to separate them. He regarded it essential to see more material to resolve their systematic status. Watanabe (1956) also treated *E. potanini* and *E. ruficeps* Mocsáry as separate species;

E. potanini from China and Hokkaido (a new record), and *E. ruficeps* from Japan, Siberia, Manchuria, and Sakhalin. Subsequently, Stroganova (1968), Smith (1978) and Taeger et al (2010) have considered all as a single, variable species, accepting Takeuchi's (1938) classification.

We have not examined the holotype of *X. potanini* Jakovlev. Based on the description (Jakovlev 1891), especially the black and red color of the head and black legs, it cannot be the other species treated here. The description is sufficient to place *X. potanini* as the widespread species treated here.

We conclude that all species listed in the synonymy are conspecific and that characters previously used to separate them are variable, agreeing with Takeuchi (1938) and Maa's (1949) study of variation. Size does not mean much in xiphydriids where the same species can vary considerably in length. We have checked about 48 females and males, and they are 10–20 mm long. Number of antennomeres in multiarticulated species can vary. Of 30 specimens, 56 antennae were intact, and they have 13 antennomeres (13 antennae), 14 (34), 15 (7), and 16 (2). Of the 26 specimens with both antennae intact, five specimens have different number of antennomeres (13 and 14 in all cases) on each antenna. Watanabe (1956) also noted that number of antennomeres can vary from 13–15. The wing color and sculpture of the mesopleuron can vary slightly, the latter sometimes slightly denser in smaller individuals. Wing venation can vary in xiphydriids, as pointed out by Smith (2008), and shapes of the cells as pointed out by Semenov and Gussakovskij (1935) are rather vague.

Matsumura's species, *X. ruficeps* (and *X. akazui* if not considered a replacement name), is with little doubt synonymous with *E. potanini*. The descriptions are brief, but compare well with *E. potanini*, and the specimens are from Hokkaido and Honshu where nothing else can be confused with *X. potanini*.

Zirngiebl (1937) described *E. maidli* from eastern Siberia. There is nothing in this area that can be confused with *E. potanini*. Zirngiebl's description agrees with *E. potanini*, and comparison with images of the paratype (S. Schmidt, pers. comm.) confirmed its synonymy.

Euxiphydria subtrifida was described from males from Chekiang, China. Even Maa (1949) had reservations about its validity, stating that it was probably inseparable from *E. ruficeps*. Males we have seen of *E. potanini* from China agree with Maa's description, and we therefore propose its synonymy under *E. potanini*.

Euxiphydria pseudoruficeps Okutani

http://species-id.net/wiki/Euxiphydria_pseudoruficeps

Figs 23–29

Euxiphydria pseudoruficeps Okutani 1966: 311, Figs 7, 8.

Diagnosis. Length, 11.5 mm. Black except head entirely orange (Fig. 24). Forewing uniformly lightly infuscated; hind wing somewhat paler on basal half (Fig. 23). An-



Figures 23–24. *Euxiphydria pseudoruficeps*, holotype **23** Dorsal view **24** Lateral view.

tenna (Fig. 29) with 14 or 15 antennomeres; length of first four antennomeres as 1.0:0.3:0.8:0.4. Sculpture on frons consisting of straight to irregular carinae, not reticulate (Fig. 28). Head from above gently rounded behind eyes, distance behind eyes much longer than eye length (Fig. 27). Malar space narrow between eye and antennal groove, much shorter than width of groove (Fig. 28). Axilla and mesoscutellum with



Figures 25–29. *Euxiphydria pseudoruficeps*, holotype **25** Thorax, lateral view **26** Thorax, dorsal view **27** Head, dorsal view **28** Head, front view **29** Antenna.

irregular longitudinal carinae, posterolateral and posterior sides smooth and shiny (Fig. 26). Mesepimeron with long, distinct, almost parallel carinae (Fig. 25). Hind basitarsomere subequal to length of remaining tarsomeres combined. Length of sheath slightly shorter than length of basal plate. Male unknown.

Specimens examined. Holotype. Female, labeled “[FORMOSA] Tattaka, 31.May.1965, T. Shirôzu” (KU). Okutani (1966) stated “31-v-1965, Sungkang, Formosa, T. Shirôzu leg.”. TAIWAN: “[Taiwan], Sungkang, 2000m, Nan-tou-Hsien, 19–25.iv.1987, C. C. Lo (1 ♀, NSMT).

Discussion. The two specimens examined are very similar, though the carinae on the frons and mesoscutellum of the holotype are somewhat more distinct than in the other specimen.

***Euxiphydria vietnamensis* Smith & Shinohara, sp. n.**<urn:lsid:zoobank.org:act:28E6D4CB-E05C-4B77-8527-6E52632DEF0A>http://species-id.net/wiki/Euxiphydria_vietnamensis

Figs 30–35

Holotype. Female, labeled “Deo O Quy Ho, 1750m, Sa Pa, Lao Cai Prov., Vietnam, 12–17.v.1995, A. Shinohara (NSMT).

Description. *Female.* Length, 14.0 mm.

Color. Head red; black on ocellar area and extending posteriorly to near occiput through center of postocellar area (Figs 33, 34). Abdomen black with white spot on side of eighth tergite (Fig. 30). Legs black with basal third of hind tibia and hind basitarsomere white (Fig. 30). Wings uniformly, lightly infuscated; hind wing somewhat more hyaline on basal half.

Head. Antenna with 19 antennomeres; length of first four antennomeres as 1.0:0.4:0.9:0.5. Frons with curved almost parallel carinae (Fig. 34). Upper half of gena and vertex from posterior margin of lateral ocelli smooth, shiny. Malar space between eye and antennal groove narrow, much less than width of groove (Fig. 34). Width of gena behind eyes about 1.4× eye width. Head from above straight behind eyes, distance behind eyes slightly longer than eye length (Fig. 33).

Thorax. Pronotum smooth and shiny anteroventrally, with irregular strong carinae dorsally and posteriorly (Fig. 31). Mesoscutal middle lobe and inner margins of lateral lobes reticulate; outer lateral lobes with large smooth, shiny area (Fig. 32). Axilla and mesoscutellum entirely sculptured, reticulate (Fig. 32), mesoscutellum separated from axillae by broad, shiny punctures. Mesepisternum mostly reticulate; mesepimeron anteriorly almost smooth, posteriorly with large oval punctures; metapleuron reticulate (Fig. 31). Metascutellum short, about 2× broader than long, reticulate, straight posteriorly (Fig. 32). Hind basitarsomere shorter than length of remaining tarsomeres combined, as 0.8:1.0.

Abdomen. Basal plates densely punctate anterolaterally, shiny and with few punctures on medial posterior portion (Fig. 32); rest of abdomen shiny, finely punctate. Length of sheath slightly shorter than length of basal plate.

Male. Unknown.

Etymology. Named for the country of collection.

Discussion. The white lateral spot on the eighth abdominal tergite, partly white hind tibia and hind basitarsomere, the curved, almost parallel carinae on the frons, the head in dorsal view long behind the eyes, and the completely sculptured axilla and mesoscutellum will distinguish *E. vietnamensis* from other *Euxiphydria* species. This is the southernmost record for the genus.



Figures 30–35. *Euxiphydria vietnamensis*, holotype **30** Lateral view **31** Thorax, lateral view **32** Thorax, dorsal view **33** Head, dorsal view **34** Head, front view **35** Mouthparts (labial palpus on right, maxillary palpus on left).

***Euxiphydria shaanxiana* Smith & Shinohara, sp. n.**<urn:lsid:zoobank.org:act:BCFA9E69-7F46-4C58-ABF2-DF8DD57F5F85>http://species-id.net/wiki/Euxiphydria_shaanxiana

Figs 36–41

Holotype. Female, labeled “[China: Shaanxi], Kaitianguan, 2000m, 34°00'N 107°51'E, Mt. Taibaishan, Qinling Mts., 27.v.2005, A. Shinohara” (1 ♀, IZB).

Paratype. “Shaanxi, Kaitianguan, 2000 m, 34°00'N, 107°51'E, Mt. Taibaishan, Qinling Mts., 5.VI.2007, A. Shinohara” (1 ♀, NSMT).

Description. *Female.* Length, 13 mm.

Color. Head red; thorax, abdomen, and legs black (Figs 36, 37). Wings uniformly hyaline (Figs 36).

Head. Antenna with 15 antennomeres; length of first four antennomeres as 1.0:0.4:0.9:0.4. Frons reticulate in front of ocelli and between ocelli and eyes, with irregular almost parallel carinae dorsal to and between antennae (Fig. 41). Upper half of gena and vertex from posterior margin of lateral ocelli smooth, shiny. Malar space between eye and antennal groove narrow, much less than width of groove (Fig. 41). Width of gena behind eyes about subequal to eye width. Head from above rounded and narrowing behind eyes, distance behind eyes about equal to eye length (Fig. 40).

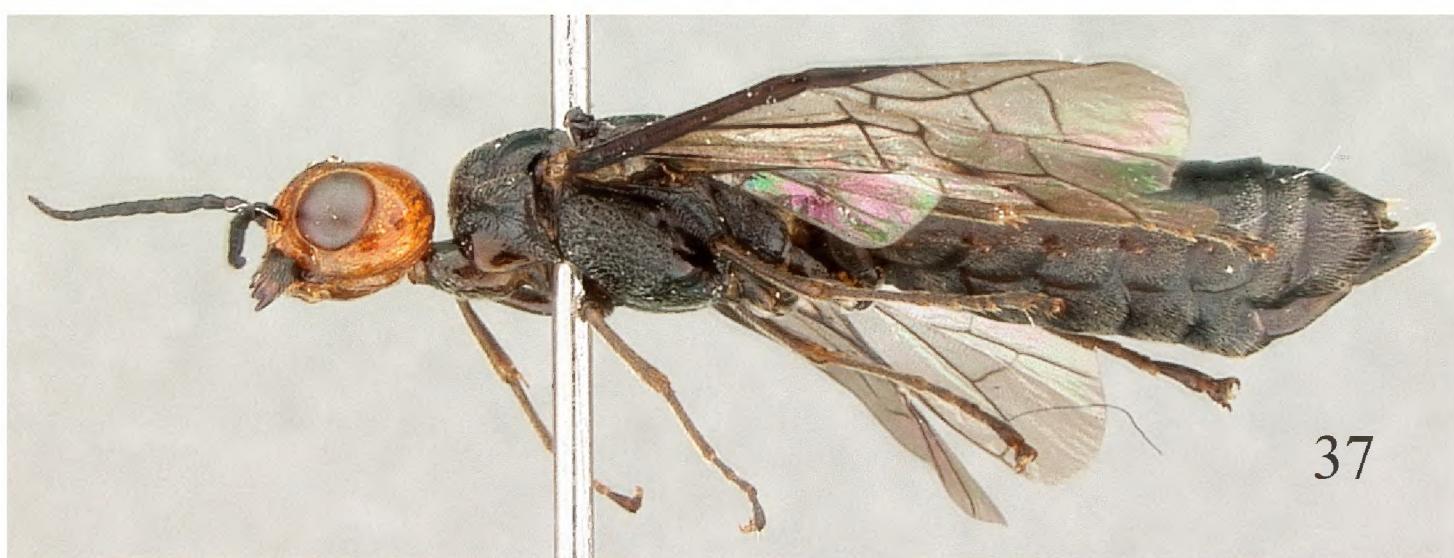
Thorax. Pronotum smooth and shiny anteroventrally, reticulate to carinate dorsally and posteriorly (Fig. 38). Mesoscutal middle lobe and inner margins of lateral lobes finely punctate to reticulate; outer lateral lobes with large smooth, shiny area (Fig. 39). Axilla and mesoscutellum finely punctate with irregular longitudinal carinae (Fig. 39), mesoscutellum separated from axillae by narrow punctures, broad lateral downturned area shining with four or five transverse carinae (Fig. 39). Mesepisternum mostly reticulate; mesepimeron anteriorly almost smooth, posteriorly with fine transverse carinae; metapleuron finely reticulate (Fig. 38). Metascutellum about 2.5× broader than long, finely reticulate, rounded posteriorly (Fig. 39). Hind basitarsomere shorter than length of remaining tarsomeres combined, as 0.8:1.0.

Abdomen. Basal plates mostly smooth and shining, finely punctate anteriorly, (Fig. 39); rest of abdomen shiny, finely punctate. Length of sheath subequal to length of basal plate.

Male. Unknown.

Etymology. Named for the Chinese province in which it was collected.

Discussion. The red head and black thorax, abdomen, and legs are similar only to *E. potanini*. In *E. shaanxiana*, the head is entirely red, behind the eyes in dorsal view sharply rounded with the distance about equal to the eye length, the sculpture on the frons consists of irregular carinae, and the axillae and mesoscutellum are more finely sculptured with the posterior portion smooth and shiny.



Figures 36–37. *Euxiphydria shaanxiana*, holotype **36** Dorsal view **37** Lateral view.



Figures 38–41. *Euxiphydria shaanxiana*, holotype **38** Thorax, lateral view **39** Thorax, dorsal view **40** Head, dorsal view **41** Head, front view.

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